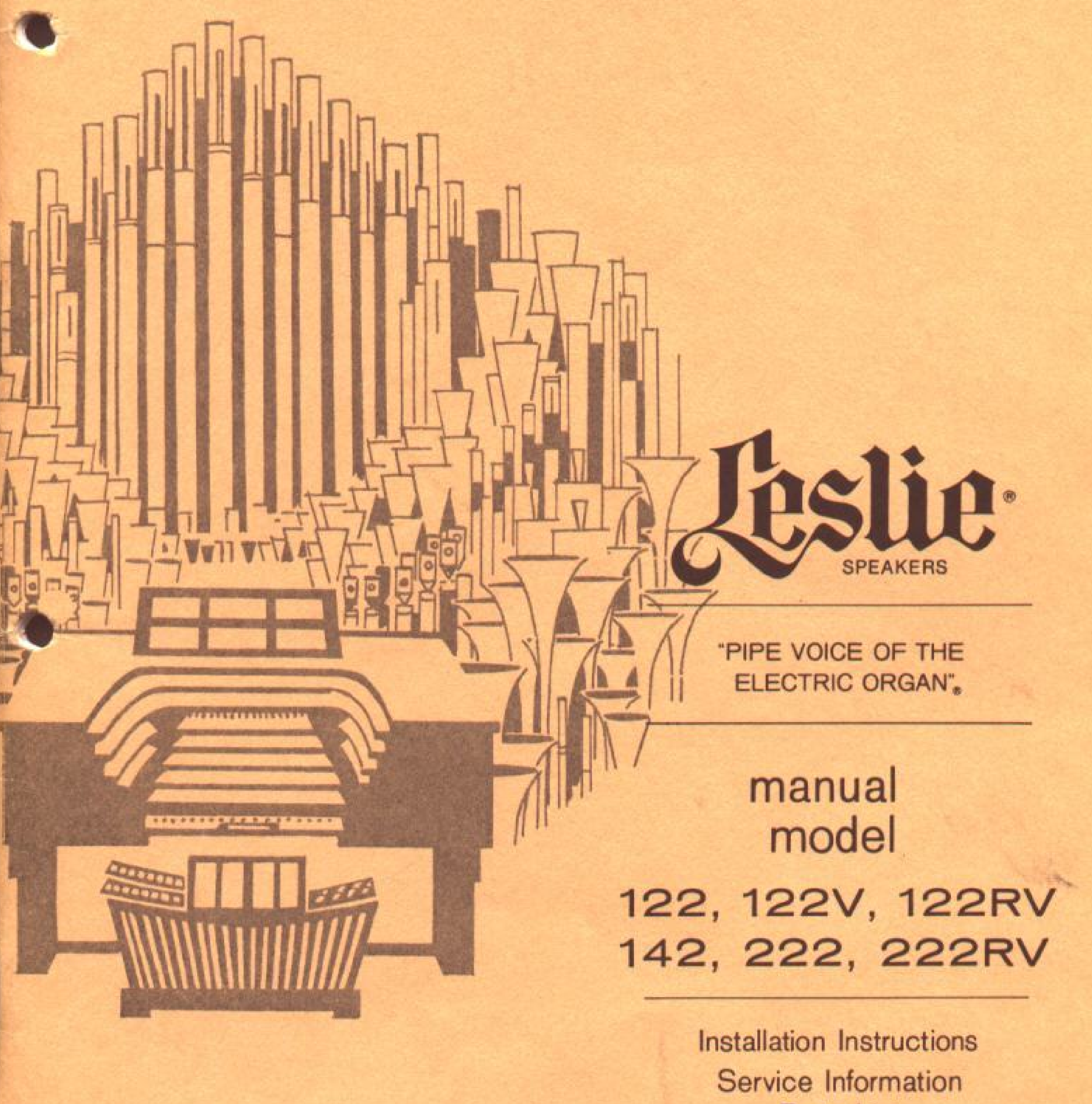


Leslie® SPEAKERS

"PIPE VOICE OF THE ELECTRIC ORGAN"®

manual model

122, 122V, 122RV
142, 222, 222RV

Installation Instructions

Service Information

Parts List

electro music

Pasadena, California

LESLIE® SPEAKERS
122, 122V, 122RV, 142, 222, 222RV

GENERAL OPERATING AND MAINTENANCE INSTRUCTIONS





Bin 30, Arroyo Annex
Pasadena, California 91109

ELECTRO MUSIC
CBS Musical Instruments
A Division of Columbia Broadcasting System, Inc.

044578
June 1971

CONTENTS

INTRODUCTION

LESLIE SPEAKERS 122, 122V, 122RV, 142, 222, 222RV

The six speakers covered in this manual were designed exclusively for use with Hammond organs.

The internal design common to these six speakers features an 800 Hz dividing network for separating; then channeling treble and bass frequencies to the treble and bass speakers. Signal above 800 Hz is channeled to the compression driver in the Treble rotor, while signal below 800 Hz drives the 15″ bass speaker.

A pair of two-speed motor assemblies drive the Bass and Treble rotors at fast (Tremolo) or slow (Chorale) speed. The Tremolo switch supplied with the console connector controls rotor speed.

In the 122RV, 222RV Speakers, a reverb channel is added to further enhance the capabilities of the Hammond organ. The 122RV Reverb amplifier drives one high-efficiency 6″ x 9″ speaker while the 222RV uses two 6″ x 9″ speakers.

122V models can be turned into 122RVs through addition of a 020610 Reverb Kit. However, the 122 or 122R models cannot be converted into 122RVs in this manner.

Signal path through reverb and non-reverb speakers is traced in figures 1 and 2. Figure 1 includes models 122, 122V (without reverb), 142, and 222. Figure 2 covers 122RV and 222RV models.

BLOCK DIAGRAM: 122,122V,142,222 SPEAKERS

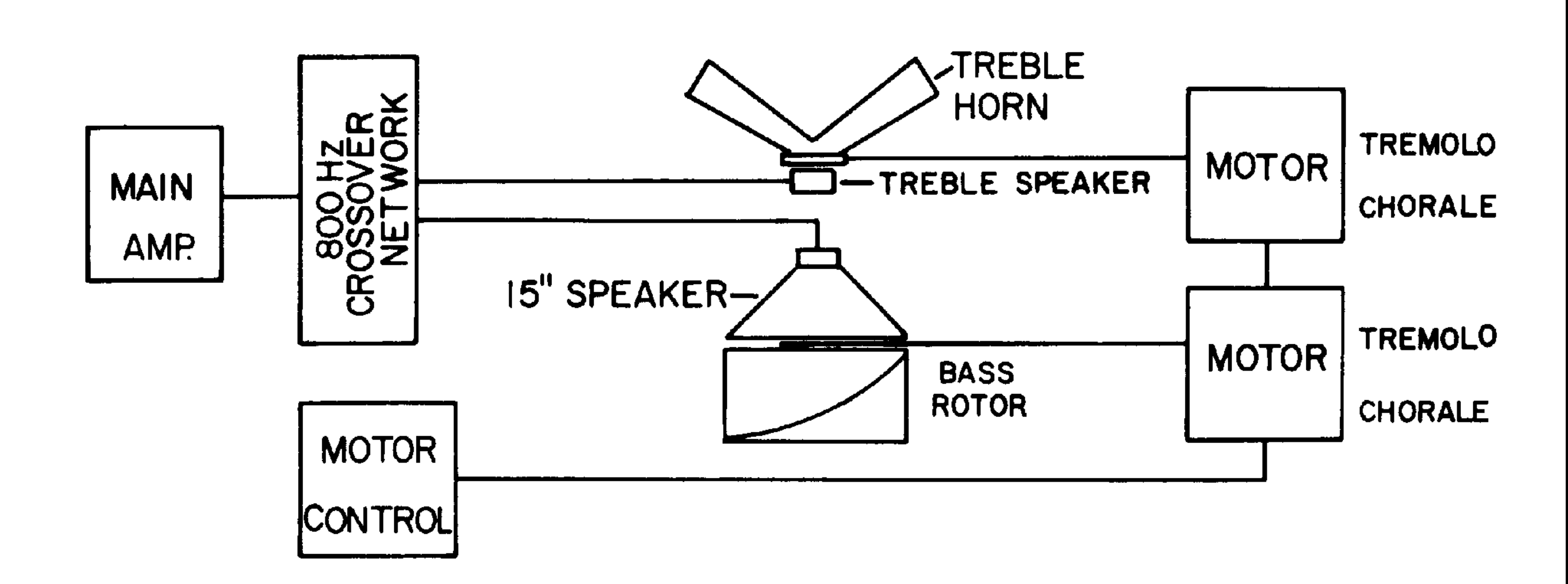


Fig. 1

BLOCK DIAGRAM: 122RV,222RV SPEAKERS

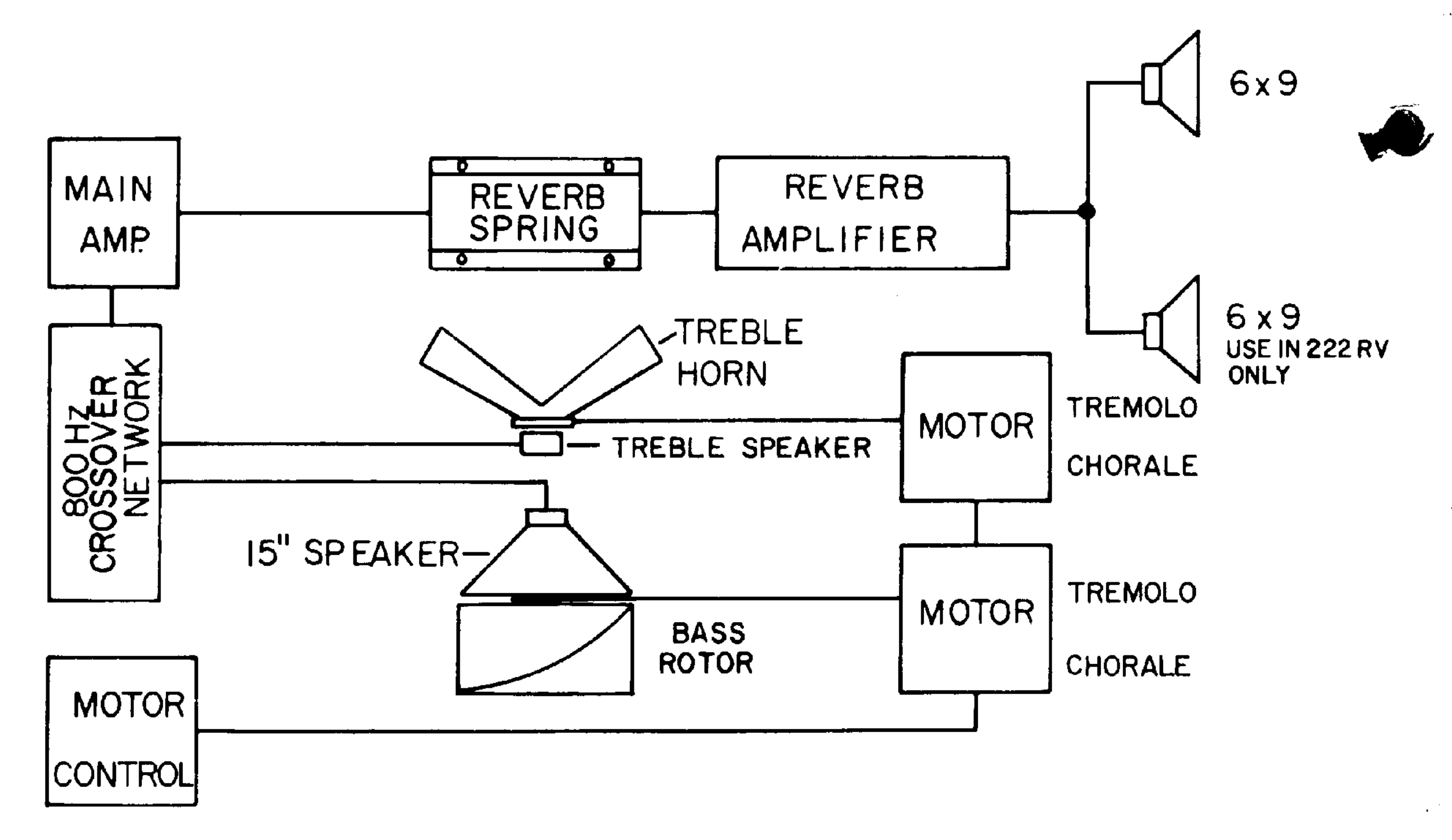


Fig. 2

SPECIFICATIONS

CABINET

All Models: Selected hardwood veneers with quality lacquer finish in woods and colors to harmonize with organ consoles.

DIMENSIONS

Model 122, 122V, 122RV: 41″ high, 29″ wide, 20½″ deep.
Model 142: 33″ high, 29″ wide, 20½″ deep.
Models 222, 222RV: 30″ high. 40″ wide, 20⅛″ deep.

LOUDSPEAKERS

Models 122, 122V, 142, 222:
Treble: Compression-type driver, permanent magnet, 16 ohm impedance.
Bass: 15 inch heavy duty, permanent magnet, 16 ohm impedance.

Models 122RV, 222RV:
Treble: Compression-type driver, permanent magnet, 16 ohm impedance.
Bass: 15 inch heavy duty, permanent magnet, 16 ohm impedance.

Reverb:
122RV: One wide-range 6″ x 9″, permanent magnet, 16 ohm impedance.
222RV: Two wide-range 6″ x 9″, permanent magnet. 16 ohm impedance each.

ELECTRICAL

All models available in versions to operate on 117, 234, or 250 volt, 50 or 60 Hz AC current.

AMPLIFIERS

Models 122, 122V, 142, 222: One channel, 40 watts output.
Models 122RV, 222RV: Rotor and reverb amplifier provide two channels with a combined 56 watt output.

POWER CONSUMPTION

Models 122, 122V, 142, 222: 190 watt, 2.1 amp
Models 122RV, 222RV: 250 watt, 2.6 amp

WEIGHT

MODEL:
122: 135 lbs. net; 155 lbs. boxed for shipment
122V: 138 lbs. net; 159 lbs. boxed for shipment
122RV: 157 lbs. net; 173 lbs. boxed for shipment
142: 124 lbs. net; 140 lbs. boxed for shipment
222: 138 lbs. net; 159 lbs. boxed for shipment
222RV: 157 lbs. net; 174 lbs. boxed for shipment

Guarantee: One year from the date of purchase, covering both workmanship and materials. This guarantee does not include vacuum tubes which are guaranteed by their manufacturer, and does not cover belts or speaker cones which may wear out in less than one year due to severe usage.

OPERATION

PREPARING THE SPEAKER FOR USE

After unboxing speaker:

1. Remove speaker's shipping skid. Then set the cabinet upright on the floor. If floor is uneven, use wedges to prevent the cabinet from rocking.
2. **122, 122V, 122RV, 142, 222RV Models:** Remove upper and lower back covers.
   222 model: Remove lower back only.
3. Install the console connector and controls on the Hammond per instructions. Then connect the speaker to the Hammond with the speaker cable supplied with the console connector.

IMPORTANT: Before connecting the speaker, make certain voltage indicated on speaker's Main (Rotor) amp matches line voltage to be used. High voltage (234/250 volt) Rotor and Reverb amps may be converted to operate on either 234 volt or 250 volt line voltage. See pages 6 and 7 of this manual.

5. Remove shipping blocks from the motors and save them for future use.
6. Check Treble rotor drive belt. It should span the motor drive pulley, idler pulley, and Treble rotor pulley. It is located behind Rotor amp in models 222, 222RV or on upper shelf in models 122, 122V, 122RV, and 142.
7. Select desired speed of the Treble rotor by slipping Treble drive belt into one of the three grooves in the 3-step motor drive pulley. Middle groove provides a medium speed, while the smaller and larger grooves provide slower and faster speeds respectively.
8. Replace cabinet back cover(s):
9. **122RV, 222RV models:** Locate the metal plate on the cabinet back. Loosen plate's mounting screw and rotate plate to expose packing material. This packing material protects the Reverb spring during shipment. Remove packing and save it for future use.

ROTOR AMPLIFIER VOLUME CONTROL SETTING (All Models)

The volume level should be set on the basis of maximum demand, avoiding distortion or overload, as follows:

1. Use "full organ" registration, that is, with all stops in use and with the swell pedal at maximum. Play a full chord and a single Pedal note.
2. Advance the volume control on the LESLIE amplifier from zero up to a point where some distortion can be heard.
3. Back off the volume control setting just far enough to eliminate all distortion. This is the correct setting for maximum undistorted loudness, and usually no further adjustment will be necessary. **(Distortion, when continuous, can seriously damage speaker components.)**

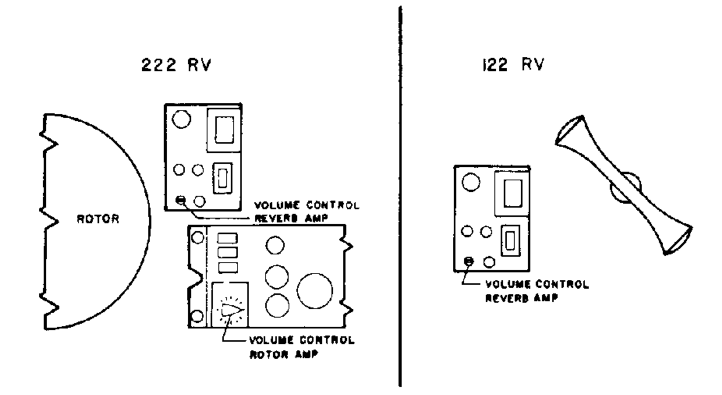


Fig. 3

REVERB AMPLIFIER CONTROL SETTING (122RV/222RV Models Only)

The reverberation volume is adjusted at the controls shown in Fig. 2. The desired amount of reverberation volume is up to the individual's taste. Turn control clockwise to increase volume. See diagram for control location.

REMOTE REVERB CONTROL KIT

With this handy unit, the organist can select the reverb effect desired directly from the organ console. Complete installation instructions are included with the kit, which is currently supplied with 122RV, 222RV models. Kit is also available separately through your LESLIE speaker dealer in brown (015255), ebony (015305), or ivory (015313).

CONSOLE CONNECTOR KITS

Most Hammond organs can be adapted for Leslie speakers by using the appropriate Leslie console connector kit. Consult the LESLIE Speaker Price List to find the proper console connector kit for your particular organ/speaker combination.

INSTALLATION

See instructions packed with console connector designed for your organ/speaker combination.

CONSOLE CONNECTOR CONTROLS

The chassis of the console connector serves as a junction point for the LESLIE controls provided with the console connector.

Echo controls are included where the organ has its own self-contained speaker. The control's three switching positions—Echo, Ensemble, and Main—permit either the organ speaker or the Leslie speaker to be played separately, or permit both speakers to be operated simultaneously. Echo controls are also useful in multiple speaker installations, where two or more speakers may be controlled in the same manner.

The Tremolo switch controls rotor speed through the fast and slow motors of the two-speed motor assemblies. This varying of rotor speed creates the contrasting Tremolo and Chorale effects.

Reverb function in 122RV, 222RV cabinets is controlled by the reverb control kit packed in these speakers.

Below is a description of LESLIE control switching functions in their various positions:

ECHO Control
MAIN: Only internal or external HAMMOND speaker will operate.
ENSEMBLE: Both HAMMOND and LESLIE Speakers will operate.
ECHO: Only external LESLIE Speaker will operate.
TREMOLO Control
CHORALE: Small motors actuated to brake Bass and Treble rotors to Chorale speed.

TREMOLO: Large motors actuated, driving Bass and Treble rotors at fast (Tremolo) speed.

REVERB Control
OFF: No Reverb signal to the Reverb speaker(s).
MEDIUM: Medium volume Reverb signal (depending on Reverb amp volume control setting) to the Reverb speaker(s).
ON: Full volume Reverb signal to the Reverb speaker(s). (Depending on Reverb amp volume control setting).

ROTOR BRAKE ACCESSORY

The Tremolo control's circuitry makes no provision for stopping the Treble and Bass rotors. Complete braking is unnecessary in normal use, since the slow movement of the rotors at Chorale speed provides a pleasant effect when playing sustained chords and is virtually imperceptible during rapid musical passages.

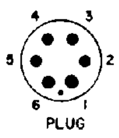
If you desire to stop the rotors completely, a 034256 accessory brake may be installed. Complete installation instructions are provided with the brake kit. Available through your LESLIE speaker dealer.

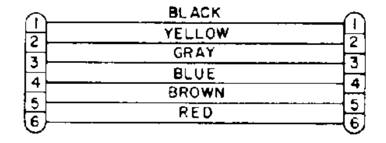
CONNECTING CABLE

A 30 foot, 6 conductor cable (017277) is packed in the console connector package. When the distance between organ and speaker is in multiples of 30 feet, two or more 017277 cables may be connected to each other. Additional 017277 cables may be obtained through your LESLIE speaker dealer.

When the speaker-to-organ distance is not a multiple of thirty feet, a connecting cable may be made up from a 061721 plug, 029546 socket, and the required length of 010298 bulk cable.

Follow the color code in Fig. 4 when wiring the plug and socket to the bulk cable.





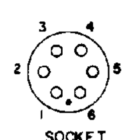


Fig. 4

MULTIPLE SPEAKER INSTALLATION

When a single speaker will not produce sufficient undistorted volume, additional speakers may be added. Even when no volume increase is necessary, a second LESLIE cabinet enhances any installation, adding fullness and a richer, pipe-like quality to the sound.

Adding speakers is like adding chests of pipes in a pipe organ: The sound is distributed over a broad area. This effect of "bigness" is most pronounced when the speakers in a multiple installation are separated from each other by fifteen to twenty feet. Also, the selection of a different pulley groove (upper motor) for each added speaker provides contrasting tremolo effects, thus further enhancing the pipe organ effect.

The speakers are connected together by power relays, with the first speaker in the chain connected to the organ, the second speaker connected to the first, the third connected to the second, etc. The power switch at the organ controls power to all speakers in a multiple installation.



Power Requirements

For the second and all successive speakers, a 117V 034496 power relay or 234/250V 039099 power relay must be used. In addition to acting as a junction for the speaker connecting cables, the power relay has its own AC plug for powering the added speaker from a wall socket. This eliminates the danger of overloading the organ's power circuits.

Procedure for Connecting Additional Speakers

1. Connect the socket end of the speaker connecting cable to the plug on the power relay. Connect speaker cable plug to its console connector socket in the organ.
2. Connect power relay pigtail to the LESLIE speaker.
3. Insert connecting cable for the second speaker into the power relay socket.
4. Plug the AC plug from the power relay into a convenient AC outlet.

This procedure should be followed, using an additional power relay, for each speaker added to the system.

BROADCASTING AND RECORDING

When a LESLIE speaker is used in a broadcast or recording set-up, allowance must be made for the limitations of the microphone. The microphone will not pick up exactly the same acoustics heard in the studio. The ideal set-up can only be accomplished by experiment. Here are a few general recommendations for recording and broadcasting:

1. Select a fairly "live" studio.
2. Play the organ at medium to full volume level.
3. Place microphone ten to fifteen feet from the speaker.
4. Do not place the microphone at the same height as the upper speaker.

NON-ORGAN USE OF THE LESLIE SPEAKER

The LESLIE speaker is a high-quality product, designed expressly for use with electric organs and other musical instruments. The unique musical characteristics of this speaker stem from electrical and acoustical properties very different from those of stereo or high fidelity speakers. The speaker will function satisfactorily only in its intended use as a musical instrument, and no other applications are recommended.

SHIPPING

The speaker may be moved or carried in any position. However, when shipping the cabinet, it should be upright, with shipping blocks in place to protect the motors and rotors.

Insert the packing slug into the hole covered by metal plate at the back of 122RV and 222RV cabinets. This will protect the reverb springs during shipment.

SERVICING

ORDERING PARTS

Standard hardware, connectors, and electronic components may be obtained locally. Non-standard items may be obtained through a LESLIE speaker dealer. Orders should include part numbers provided in the parts lists of this manual. Model and serial numbers should also be included.

PREVENTIVE MAINTENANCE

The speaker is carefully engineered for durability and maximum service. Except for lubrication and periodic belt tension checks, the speaker requires little attention.

CAUTION: Keep hand and tools away from the spinning parts when adjustments are made inside the cabinet. The rotor's weight and momentum could cause personal injury or damage other components.

MOTOR LUBRICATION

Usage, climate, and dust conditions determine motor lubricating requirements. In normal service, annual motor lubrication is usually sufficient. However, if the speaker is used several hours a day, lubrication every three to four months may be necessary. Remember that over-oiling a motor can be as detrimental as no lubrication whatsoever. Motors failing to start immediately may have dried up, dirt-clogged bearings. Motor cleaning and lubrication is covered on page 9 of this manual.

CHECKING ROTOR BELTS

Although the Bass and Treble drive belts normally last several years, they should be regularly checked. Worn or frayed belts cause noise and reduce rotor speed due to belt slippage. Instructions for replacement are given on page 8 of this manual.

CHECKING AMPLIFIER TUBES

Speaker hiss, crackle, and other signal distortions indicate need for a tube check with a tube tester. In some cases, tube weakening and resultant sub-standard speaker performance may go unnoticed. Therefore, check tubes regularly and replace weak ones before they deteriorate completely. Don't overlook the Reverb amplifier tubes in models 122RV, 222RV.

CHECKING LINE VOLTAGE

Line voltages lower than 100 volts (200 volts in 234 volt models) or higher than 130 volts (260 volts in 234 volt models) will result in distortion due to too little power or overheated, burnt out components due to excessive voltage. A voltage regulating device obtainable at an electronic parts supply store will correct this problem. High voltage amplifier conversions to 234 volt or 250 line current are covered on pages 6 and 7 of this manual.

ELECTRONICS SERVICING

ROTOR (MAIN) AMPLIFIER

Rotor Amp Removal (122, 122V, 122RV, 142)

1. Remove cabinet's lower back.
2. Disconnect all leads and power plugs from the rotor amplifier.
3. Find the screw in the center of the chassis mounting plate. Mounting plate is located beneath socket end of the Rotor amplifier.
   CAUTION: Do not remove the nuts on the mounting plate. Nuts do not fasten the rotor amplifier to the shelf.
4. Remove mounting screw and slide rotor amp out of the cabinet. (When replacing amplifier, be sure the rear mounting plate engages with the mounting bracket attached to the cabinet front.

Rotor Amp Removal (222, 222RV)

1. Remove cabinet's lower back.
2. Disconnect all leads and power plugs from the Rotor amplifier.
3. Remove mounting screws from either end of the amplifier. **CAUTION: Do not remove the mounting plate nuts. They do not fasten the Rotor amp to the speaker shelf.**
4. Slide the Rotor amp out of the cabinet.

ROTOR AMP FILTER CAPACITOR

This capacitor is of the finest quality and should last several years in normal use. Speaker hum or blown fuses may indicate need for a replacement. Replacement capacitors should be identical to the original unit, which is rated at 30-30-30-10 mfd, 475 VDC.

Filter Capacitor Removal

Unscrew the two nuts fastening capacitor mounting plate to the amplifier chassis and unplug the capacitor.

Filter Capacitor Replacement

1. Snip off the filter capacitor case lug without a hole to permit proper filter alignment.
2. Align the three remaining lugs with their respective socket holes; plug in.
3. Replace capacitor mounting plate, using nuts to fasten plate securely.

ROTOR AMPLIFIER FUSES

Both 117 volt and 234 volt/250 volt main amplifiers use a replaceable "Slo-Blo" 1½ amp. fuse for protection against short circuits. When a fuse fails, find the cause and eliminate **it before** replacing the fuse. Replacement fuses rated higher than 1½ amps. should never be used.

ROTOR AMPLIFIER DISTORTION

Rotor amp distortion is usually caused by setting the Rotor amp volume control too high. (See page 3 for proper volume control adjustment.) Extra gain has been designed into the Rotor amplifier to compensate for possible low organ output. Use this extra gain carefully, as an over-set volume control at the Rotor amplifier will cause distortion and possible Bass speaker damage whenever the organ expression pedal is fully depressed.

REMOVAL OF POWER OR OUTPUT TRANSFORMER

1. Disconnect transformer leads. Be sure to match the right color lead to its corresponding location. Draw a diagram showing terminals and wire colors to facilitate rewiring. Detach transformer.

REPLACEMENT

1. Fasten new transformer in place, using mounting nuts provided.
2. Measure, clip, and solder new transformer leads to correct locations.

NOTE: Leads supplying plate voltage to the tubes should not be excessively long.

234V/250V ROTOR AMP. CONVERSIONS

A special power transformer is used in Rotor amplifiers destined for countries using 234 volt or 250 volt line current. As line voltage may vary from country to country, both 234 volt and 250 volt transformer taps are provided. Factory-wired voltage is indicated by a sticker on top of the 234 volt/250 volt amplifier chassis. If this voltage does not match line voltage, convert to proper voltage as follows:

234 VOLT TO 250 VOLT CONVERSION:

1. Disconnect WHITE wire from fuse located next to console connector socket on amplifier chassis. (See Fig. 5A.)
2. Disconnect BROWN wire from two-lug terminal strip located next to load resistor switch. (See Fig. 5B.)
3. Solder WHITE wire to two-lug terminal strip at the lug formerly occupied by BROWN wire. (See Fig. 5B.)
4. Solder BROWN wire to fuse lug formerly occupied by WHITE wire. (See Fig. 5A.)

Conversion to 250 volt line current is now complete.

250 VOLT TO 234 VOLT CONVERSION:

1. Disconnect BROWN wire from fuse located next to console connector socket on amplifier chassis. (See Fig. 5A.)
2. Disconnect WHITE wire from two-lug terminal strip located next to load resistor switch. (See Fig. 5B.)
3. Solder BROWN wire to terminal strip lug formerly occupied by WHITE wire. (See Fig. 5B.)
4. Solder WHITE wire to fuse lug formerly occupied by BROWN wire. (See Fig. 5A.)

Conversion to 234 volt line current is now complete.

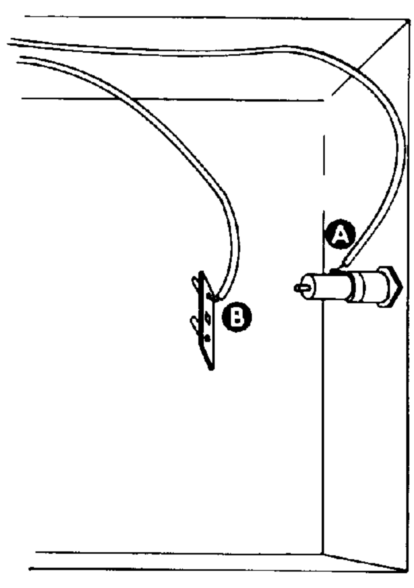


Fig. 5

IMPORTANT: (High Voltage 122RV, 222RV models only.)

In high voltage 122RV or 222RV Speakers, the Reverb amplifier as well as the rotor amplifier must be wired for the line voltage to be used. High voltage conversions of the Reverb amplifier are covered on page 7 of this manual.

REVERB AMPLIFIER (122RV, 222RV MODELS)

The Reverb amplifier provides 16 watts of reverberated signal for driving either one or two wide range 6″ x 9″ Reverb speakers. (The 122RV has one reverb speaker; 222RV has two reverb speakers.)

The volume control on the Reverb amplifier is supplemented by the 015255 remote reverb control now shipped with 122RV and 222RV speakers. This switch allows the organist to turn off the Reverb channel or switch between medium and full Reverb volume.

Older 122V and 222RV models were shipped without this remote reverb control kit. It may be obtained separately through your LESLIE speaker dealer in a choice of brown (015255), ebony (015305), or ivory (015313). Installation instructions are packed with the Reverb control.

Reverb Amplifier Removal (122RV)

1. Remove all back covers. **CAUTION: Disconnect Reverb springs before completely detaching middle back.**
2. Disconnect Dividing Network and Reverb speaker leads from the Reverb amp. Reverb amplifier is located in left corner of the upper shelf.
3. Disconnect Reverb amp power plug and red/black leads from their sockets on the Rotor (main) amplifier.
4. Remove cork from hole in the upper shelf. Withdraw all leads through the hole and onto the upper shelf.
5. Remove screw holding Reverb amp to the shelf.

CAUTION: Do not remove the chassis mount nuts. They do not attach the reverb amp to the shelf.

6. Slide Reverb amplifier out of the cabinet.

Reverb Amplifier Removal (222RV)

1. Remove lower and upper back covers. **CAUTION: Remove wires from Reverb Spring before detaching upper back cover.**
2. After disconnecting all Rotor amplifier wires, undo screws fastening Rotor amp to the shelf and remove it.
3. Disconnect all wires leading to the Reverb amplifier. To do this, loosen the cork in the upper shelf and extract the brown and black leads from the reverb spring.
4. Remove Reverb amplifier's two mounting screws and slide it out of the cabinet. **CAUTION: Do not unscrew the nuts. They do not fasten the reverb amplifier to the shelf.**

Reverb Amplifier Replacement

1. After fastening Reverb amplifier in place with its mounting screw(s), reconnect wires as follows:
   a. Reverb amp AC plug to AC socket marked "Reverb" on the Rotor (main) amplifier.
   b. Red/Black reverb amp lead to two-pin socket on the Rotor amplifier.

c. Small and large Reverb speaker plugs to the 2-pin socket on the Reverb amplifier.
d. Red/Black dividing network plug to its Reverb amplifier socket.
e. Black shielded Reverb amp lead to the Reverb spring socket marked: OUT.
f. Brown Reverb amp lead to Reverb spring marked: IN.
2. Replace cork and back covers.

REVERB AMP FILTER CAPACITOR

The Reverb amp's electrolytic filter capacitor is a high quality unit which should last several years in normal use. Speaker hum or blown fuses may indicate need for a replacement. Replacement capacitors should be identical to the original capacitor, which is rated at 30-30-30-10 mfd, 475 VDC.

Electrolytic Capacitor Removal

1. Remove Reverb amp from cabinet (see page 6).
2. Sketch the capacitor's underside, showing which color lead or resistor goes to which location. This practice greatly simplifies correct wiring of replacement capacitor.
3. Measure distance from the chassis of the Reverb amp to the top of the capacitor.
4. Disconnect all leads and resistors from the capacitor.
5. Remove the two phillips screws fastening the clamp to the reverb amplifier chassis.
6. Remove capacitor from chassis. Then detach the clamp from the capacitor.

Electrolytic Capacitor Replacement

1. Reverse capacitor removal procedure, being careful to insert replacement capacitor to the height of the old capacitor. Treble horn should rotate freely over the new capacitor. Use the previously drawn sketch to facilitate correct wiring of replacement capacitor.

REVERB AMPLIFIER FUSES

Both 117 volt and 234 volt/250 volt versions of Reverb amplifier use a ¾ amp., "Slo-Blo" fuse to protect against short circuits. When a fuse fails, find the cause and eliminate it **before** replacing the fuse. Replacement fuses rated higher than ¾ amp. should never be used.

REVERB AMPLIFIER DISTORTION

Reverb amplifier distortion is usually caused by setting the Reverb amplifier volume control too high. (See page 3 for proper Reverb amplifier control adjustment.) Extra gain has been designed into the Reverb amplifier to compensate for possible low console output. Use this extra gain carefully, as the maximum volume control setting usually causes distortion whenever the organ expression pedal is fully open.

REVERB AMP TRANSFORMERS

Transformer Removal

1. Sketch the transformer's underside, showing lead colors and their corresponding terminals. This aids greatly when connecting the new transformer. If wires are discolored beyond recognition due to environmental aging, see page 17 or 19 for rewiring Reverb amplifier power and output transformer.
2. Disconnect transformer leads from their terminals on the Reverb amplifier.
3. Remove transformer mounting screws. Then detach transformer from the amplifier chassis.

Transformer Replacement

1. Fasten replacement transformer in place, using mounting nuts from original unit.
2. Measure, clip and solder new transformer leads to correct locations in Reverb amplifier.

NOTE: Leads supplying plate voltage to the tubes should not be too long.

NOTE: (Reverb Amplifier Output Transformer only). Incorrect wiring of a replacement output transformer results in improper phasing which causes reverb amplifier oscillation. It is possible to connect leads correctly and still experience this oscillation. In this case, reverse leads from the secondary winding of the new transformer at their connection points on the speaker socket.

234V/250V REVERB AMP CONVERSIONS (High Voltage 122RV, 222RV Models)

A special high voltage power transformer is used in high voltage 122RV or 222RV models. The factory-wired voltage is indicated by a sticker on top of both Rotor and Reverb amplifiers. The voltage of these amplifiers **must** match the line voltage before the speaker may be used. A speaker wired for 250 volts will produce distortion when operated on 234 volt line current, while a speaker wired for 234 volts will overheat and suffer component damage when overpowered by 250 volt line current.

If the speaker's Rotor amplifier voltage requirement differs from the line voltage, match them as outlined on page 6. Then convert the Reverb amplifier to the line voltage as follows:

234 VOLT TO 250 VOLT CONVERSION

1. Remove BROWN wire from the one-lug terminal strip. (See Fig. 6A.)
2. Remove WHITE wire from circuit board mounted upright to underside of chassis. (See Fig. 6B.)
3. Solder BROWN wire to circuit board. (See Fig. 6B.)
4. Solder WHITE wire to the one-lug terminal strip. See Fig. 6A.) Conversion for 250 volt use is now complete.

250 VOLT TO 234 VOLT CONVERSION

1. Remove WHITE wire from the one-lug terminal strip. See Fig. 6A.)
2. Remove BROWN wire from circuit board mounted upright to underside of chassis. (See Fig. 6B.)
3. Solder WHITE wire to circuit board. See Fig. 6B.)
4. Solder BROWN wire to the one-lug terminal strip. (See Fig. 6A.)

Conversion for 234 volt use is now complete.

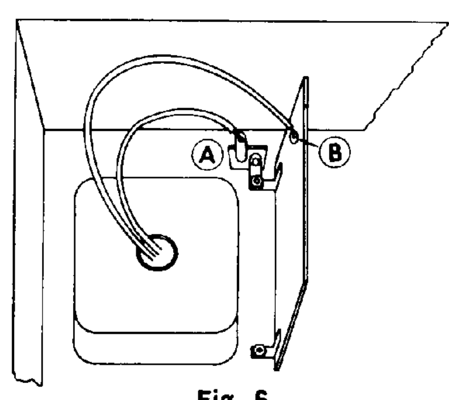


Fig. 6

MECHANICAL SERVICING

ROTOR DRIVE BELTS

Bass Drive Belt Adjustment:
(122, 122V, 122RV, 142 models)

1. Loosen wingnut on Bass motor assembly's adjustable mounting bracket. It is located on underside, lower shelf, near the rear of the cabinet.
2. Twist lower motor assembly to left until drive belt is taut; then gently release motor assembly. Allowing it to snap back results in excessively loose belt adjustment.
3. Tighten wingnut.
4. Switch the Tremolo control between Tremolo and Chorale, observing time required for the Bass rotor to reach Chorale speed. This should take about five to eight seconds. If it does not, readjust belt tension.

Bass Drive Belt Adjustment (222, 222RV models)

1. Loosen the wingnut on the Bass rotor motor's adjustable mounting bracket. This wingnut is located on underside of lower shelf nearest the **front** of the cabinet.
2. Twist motor assembly to the right; then gently release it. Allowing motor assembly to snap back results in excessively loose belt tension.
3. Tighten the wingnut.
4. Switch the Tremolo control between Tremolo and Chorale, observing time required for Bass rotor to reach Chorale speed. This should take about five to eight seconds. If it does not, readjust belt tension.

Bass Drive Belt Removal

1. Unplug the 15″ Bass speaker leads from the Dividing Network.
2. Remove the eight screws fastening Bass speaker to the shelf. Lift speaker straight up; then out of cabinet. **CAUTION: Be careful not to puncture speaker cone with your fingers or the upper bearing assembly on the rotor shaft.**
3. Slide the exposed upper rotor support off rotor shaft.
4. Slip old belt over its pulleys and remove belt from cabinet.

Bass Drive Belt Replacement

1. Prestretch the replacement belt before installing it.
2. Slip the belt onto the shaft and motor pulleys. Belt should slip into the belt channel located on underside of the lower shelf.
3. Replace the upper rotor support bracket onto the rotor shaft. The bracket should rest in the grooves at either side of the speaker hole.
4. Replace the 15″ Bass speaker, inserting the first two screws through mounting holes in speaker rim and the rotor support beneath. Insert the remaining six screws and tighten all eight screws in place. **CAUTION: Be careful not to puncture speaker cone with your fingers or the upper bearing assembly on the rotor shaft.**

Treble Drive Belt Adjustment

The spring-mounted idler pulley provides the proper tension for the upper rotor belt. If the upper rotor belt becomes loose, bend the idler pulley spring to again provide proper belt tension.

Treble Drive Belt Removal

1. Slip old belt off the 3-step pulley and the idler pulley.
2. Lift old belt over one Treble horn; then the other. Remove belt from cabinet.

Treble Drive Belt Replacement

1. Pass the new belt over one Treble horn; then the other. Fit new belt into groove surrounding the base of the treble rotor.
2. Fit the new belt into the idler pulley groove.
3. Fit the new belt into the center groove of the 3-step pulley for normal Tremolo rotor speed. Lower groove provides higher speed; upper groove provides lower speed.

TWO-SPEED MOTORS

TWO-SPEED MOTOR REMOVAL
(All motors except 222, 222RV Treble Motor Assemblies)

1. Detach cabinet back covering the motor assembly to be removed.
2. Disconnect brown and white motor power plugs from their sockets on the Rotor amplifier.
3. Slip drive belt off its motor drive pulley.
4. Remove wing nuts fastening motor assembly to the cabinet shelf. Remove motor assembly. Note how it is mounted to facilitate its re-installation.

TWO-SPEED MOTOR REMOVAL
(222, 222RV Treble Motor Assembly)

1. Remove lower back cover.
2. Disconnect green/black lead's plug from its Divider Network socket.
3. Disconnect all plugs from the Rotor amplifier. Remove amplifier's mounting screws and remove it from the cabinet.
4. With a short shank screwdriver, loosen the three screws fastening the Treble speaker shelf (located behind Rotor amp.) to the cabinet. Do not remove screws completely.
5. Slide the entire treble speaker shelf, with its support block, out of the cabinet.
6. Slip the Treble rotor drive belt off the three step pulley on the large motor.
7. Remove motor mounting wingnuts and detach motor assembly.

MOTOR DISASSEMBLY

IMPORTANT: Complete motor disassembly is unnecessary for motor cleaning. A thorough cleaning job can be done with compressed air or a vacuum hose after detaching the small motor from the large motor.

If the motor assembly must be completely torn down, use Figure 9 as a guide during reassembly. Also, smooth off any burrs or deep scratches on the large motor shaft with emery paper 3-20 grit or finer **before** removing the end bells from the large motor. This will prevent damage to the bearings within these end bells.

Disassembly Procedure
(All motor assemblies except 222, 222RV Treble motors)

1. After removing two-speed motor assembly from the cabinet, detach small motor from the large motor by removing its four mounting bracket screws. (See Fig. 7, Small Motor Bracket Screws.)
2. Remove the two nuts and washers fastening small motor to its mounting plate.
3. Remove nut from the shaft adjustment screw on the small motor. (See Fig. 7, Shaft Adjustment Nut.)
4. Remove small motor mounting bracket.
5. Remove rim drive wheel assembly from large motor shaft with a 3/32 Allen wrench. (See Fig. 7, Rim Drive Wheel Assy.)

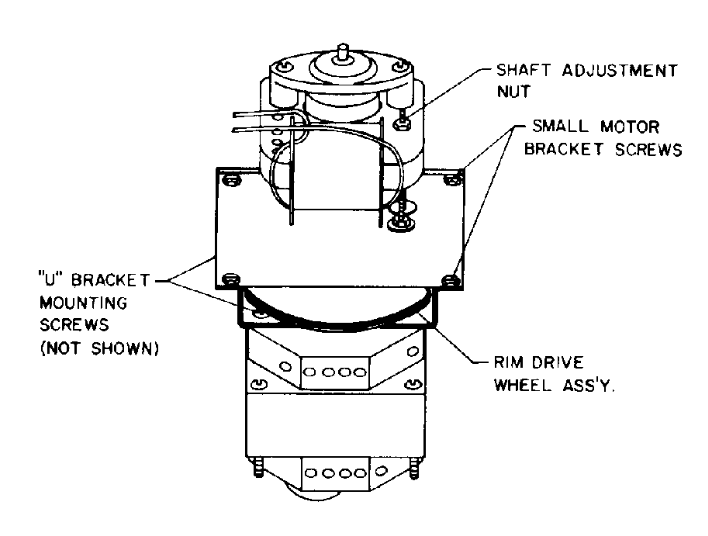


Fig. 7

Disassembly Procedure
(222, 222RV Treble Motor Assemblies only)

1. After removing Treble motor assembly from cabinet, remove the two nuts, lockwashers, and washers attaching small motor to the mounting bracket. (See Fig. 8, Small Motor Mounting Nuts.)
2. Remove shaft adjustment nut above the small motor laminations. (See Fig. 8, Shaft Adjustment Nut.) Detach small motor from the mounting bracket.
4. Remove rim drive wheel assembly from the shaft of the large motor. Use a 3/32 Allen wrench. (See Fig. 8, Rim Drive Wheel Assembly.)
5. Remove three screws attaching large motor to the mounting bracket. (See Fig. 8, 3 Large Motor Mounting Screws.)
6. Detach large motor.

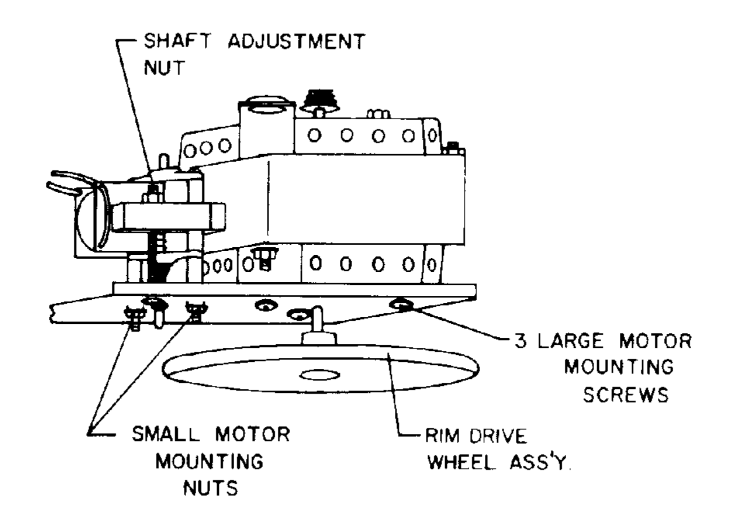


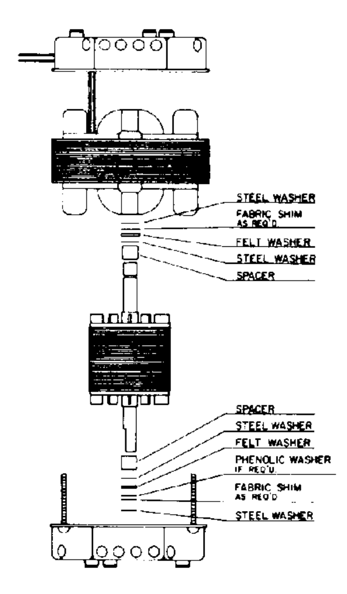
Fig. 8

MOTOR CLEANING/OILING

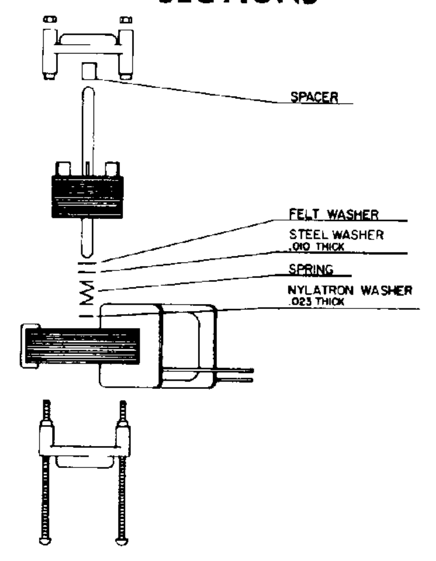
1. After disassembling motors, remove dust and dirt from the large motor end bells, using compressed air or vacuum hose. If necessary, clean small motor in the same manner.
2. Clean all accessible parts with solvent. Allow motors to dry.
3. Apply enough light machine oil (such as LESLIE oil) to soak bearing felts of each motor (See "Oil Hole" and "Oil Felt" points on Fig. 10.) Don't add more oil than felts will readily absorb. Cleaning and lubrication is now complete.

Reassembling Large & Small Motors

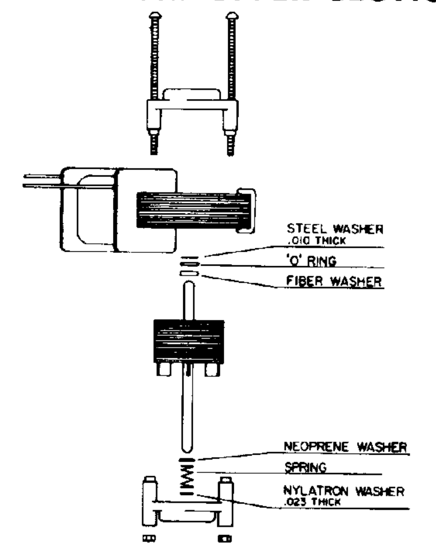
1. Reverse disassembly procedures for each motor, observing the following precautions:
   a. Insert the spacer washers on each small motor mounting screw before attaching small motor to the mounting bracket.
   b. When installing rim drive wheel assembly on the large motor shaft, push it on as far as it will go; then back it off slightly.
   c. Be sure to line up rim drive wheel set screw with the **flat** side of the large motor shaft before tightening it in place.
   d. Make certain the drive surface of the rim drive wheel assembly is smooth. If rough spots exist, twist the wheel's "O" ring around until its outer edge is smooth.
2. After reassembly is complete, clean all moving parts thoroughly with alcohol. Then re-install motor assembly in cabinet. Reverse motor assembly removal procedure, noting the following:
   a. When replacing Treble motor assembly in a 122 or 142 type cabinet, string the large motor power cables over the nearest motor mount "Z" bracket. Otherwise, the large motor power cables cannot be fed through the felt restraining loop in the middle cabinet and still reach the AC socket on the Rotor amplifier.
   b. Before adjusting the drive belt, (See Bass or Treble Drive Belt Adjustment) adjust small motor shaft as follows:



LARGE MOTOR: UPPER AND LOWER SECTIONS



SMALL MOTOR: UPPER SECTION



SMALL MOTOR: LOWER SECTION

Fig. 9

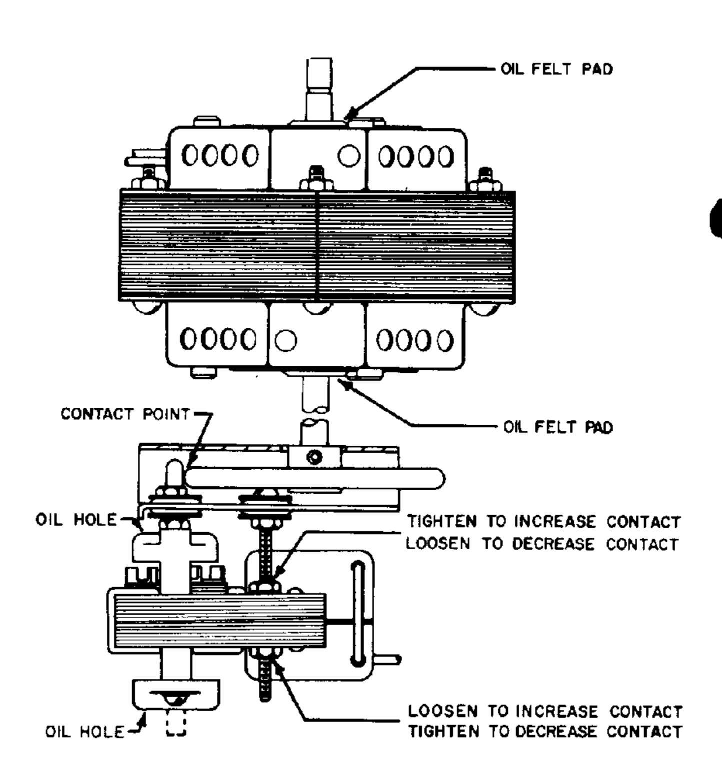


Fig. 10

SMALL MOTOR SHAFT OPERATION AND ADJUSTMENT

The small motor drives the shaft of the large motor at slow speed through the rim drive wheel assembly. (See Fig. 10.) The armature of the small motor is spring-loaded, withdrawing from the rim drive wheel assembly when the small motor is not operating.

Switching the Tremolo control to Chorale activates the small motor. The magnetic field created in the small motor laminations forces the small motor shaft into contact with the rim drive wheel assembly, braking the rotor to Chorale speed. Contact between the small motor shaft and the rim drive wheel assembly can be adjusted as follows:

1. With the speaker connected, switch the Tremolo control to Chorale.
2. Loosen the contact adjustment nuts on the small motor until small motor shaft no longer touches the rim drive wheel assembly. (See Fig. 10.)
3. Grasp one horn of the Treble horn to prevent it from turning.
4. Slowly tighten the upper shaft adjustment nut until the small motor shaft forces the drive pulley to turn under the drive belt.
5. Tighten the other adjustment nut against small motor laminations.
6. Switch the Tremolo control between Tremolo and Chorale positions to check for proper shaft adjustment.

NOTE: Make certain the outer edge of the rim drive pulley is smooth. If unevenness exists, twist the "O" ring until its outer edge is smooth.

MOTOR NOISES

Excessive motor noises may indicate misaligned large motor bearings. Tap the large motor laminations lightly with a hammer to reseat the bearings.

ROTOR, SPEAKER, DIVIDING NETWORK SERVICING

Each speaker model described in this manual incorporates a two-way speaker system containing a 15″ Bass loudspeaker and a compression-type Treble driver. Both of these loudspeakers are of the permanent magnet type with 16 ohm impedances.

A double section, M-derived frequency Dividing Network separates signal output from the rotor amp into frequencies above and below 800 Hz. Higher frequencies pass to the Treble driver in the Treble Rotor assembly, while lower frequencies power the Bass speaker atop the Bass Rotor Assembly. The rotation of the Bass and Treble rotors creates the unique acoustical effects for which Leslie Speakers are famous.

In addition to a two-way speaker system, 122RV and 222RV cabinets contain a Reverb channel. In RV cabinets, part of the rotor amp signal output is channeled through a Reverb spring and Reverb amplifier to drive either one or two wide-range 6″ x 9″ Reverb speakers. (122RV models use one 6″ x 9″ Reverb speaker, while 222RV models use two.)

SPEAKER PROBLEMS

Due to the extremely strong permanent magnetic fields in the loudspeakers, cone replacements or other repairs involving loudspeaker disassembly are not recommended. Speaker repair or replacement should be arranged through your LESLIE speaker dealer.

Should the Treble speaker become inoperative, emergency operation of the cabinet can be arranged. Simply unplug the Bass speaker from the Dividing Network and plug it directly into the amplifier output socket. There will, of course, be a loss of musical quality until the Treble speaker is either repaired or replaced.

Suspected low Dividing Network output can be checked by this same method.

CAUTION: When lifting a speaker by its edges, be careful not to allow your fingers to slip onto the speaker cone. This could puncture the cone and cause severe speaker damage.

Treble Speaker Removal/Replacement

1. Remove upper back on 122 type cabinets; lower back on 222 type cabinets.
2. Remove treble speaker's 4 pin plug (green/black leads) from the Dividing Network.
3. Remove the three screws in rim of the Treble speaker. Drop Treble speaker straight down; then out of cabinet. Treble horn may be removed, if desired, by turning it sideways.

Replacement:

When replacing Treble speaker, be sure to place the rubber, then the metal thrust washers on spindle of the Treble speaker before attaching the Treble rotor. Treble rotor will then operate at the correct height, eliminating thrust bearing noises.

Bass Speaker Removal/Replacement

1. Unplug Bass speaker leads from the Dividing Network.
2. Remove the eight mounting screws around the Bass speaker's rim.
3. Remove bass speaker by lifting it straight up; then out of the cabinet.

CAUTION: Be careful not to puncture speaker with your fingers or the upper bearing assembly.

Replacement

Reverse removal procedure.

REVERB SPEAKER REMOVAL/REPLACEMENT (122RV, 222RV Models Only)

122RV Reverb Speaker Removal

1. Remove middle back cover from cabinet.
2. Disconnect Reverb speaker leads from Reverb amplifier socket.
3. Locate speaker enclosure box on right hand side of cabinet. Unscrew wingnut, remove bracket and speaker enclosure box to expose the 6x9 Reverb speaker.
4. Remove four mounting screws from Reverb speaker, using a Phillips screwdriver. Remove Reverb speaker from cabinet.

222RV Reverb Speaker Removal

1. Remove upper back cover from cabinet.
2. Disconnect Reverb speaker leads from Reverb amplifier socket.
3. After locating speaker enclosure on front of cabinet, remove mounting screws from back of the enclosure to expose two 6x9 Reverb speakers.
4. Unscrew the four mounting screws from each Reverb speaker with a Phillips screwdriver. Remove Reverb speakers from cabinet.

Reverb Speaker Replacement (122RV, 222RV)

Reverse removal procedure outlined above. Replacement speakers should duplicate original speakers in size, impedance, and efficiency. (See specifications, page 2 of this manual). Replacement speakers are available through your LESLIE dealer. Order number 047225.

TREBLE ROTOR REMOVAL/REPLACEMENT

Removal

1. **122 type cabinets:** Remove upper and middle back covers.
   222 type cabinets: Remove the lower back cover.
2. Remove Treble speaker plug from Dividing Network.
3. Remove the three Treble speaker mounting screws and remove Treble speaker from the cabinet. Treble horn may be removed by turning it sideways.

Replacement

When replacing Treble rotor, be sure to insert the neoprene shim—then the metal thrust washer—on the spindle assembly before reinstalling it in the cabinet. The Treble horn will then operate at the correct height, with possibility of thrust bearing noises eliminated.

HORN REFLECTOR REPLACEMENT

To remove reflector, clip its three stand-off pins. Pull pins out of their horn holes. Install the new reflector with the cut edge facing upward when the horn is in operating position. To hold reflector without rattling, apply 3-M Weatherstrip cement to the pins prior to insertion. Then, using a soldering iron, melt the ends of the stand-off pins to the outer horn surface to create a sturdy mechanical bond.

BASS ROTOR REMOVAL/REPLACEMENT

(See page 13 or 15 for exploded view of bass rotor assembly.)

Removal

1. **122 Type Cabinets:** Remove middle back from cabinet.
   222 Type Cabinets: Remove lower back from cabinet.
2. Remove Bass Speaker. (See Bass Speaker Removal/Replacement).
3. Remove upper bearing support and the Bass rotor drive belt.
4. Remove rotor shaft by twisting and pulling upward. Remove the Bass rotor. Save the metal flat washer found between the bearing and rotor grommets.

Replacement

Reverse removal procedure, noting the following:

1. When centering rotor shaft over lower bearing, lift the rotor slightly and sight through shaft hole to align the lower rotor grommet with the lower bearing grommet. Be careful not to dislodge lower bearing's metal washer when inserting the rotor shaft.
2. Lubricate lower bearing end of the rotor shaft with oil or Vaseline before inserting it through the rotor. The neoprene grommets are not damaged by such lubricants.
3. Rotor pulley's drive pins should straddle the rotor spoke supported by the sound deflector.

BASS ROTOR, UPPER BEARING REPLACEMENT

(See page 13 or 15 for exploded view of bass rotor assembly.)

1. Remove Bass speaker.
2. Remove top half of bearing clamp. The ball bearing can now be lifted out and replaced.

If a newly installed bearing seems slightly loose, remove the bearing support assembly from the cabinet. Disassemble and bend the lower half of the bearing clamp so it will apply more pressure to the ball bearing.

BASS ROTOR, LOWER BEARING REPLACEMENT

(See page 13 or 15 for exploded view of bass rotor assembly.)

1. Lay cabinet on floor so that bottom is accessible.
2. Remove the two screws that fasten the bearing mounting plate to the cabinet, and remove lower bearing assembly from the shaft. Be sure to save the flat metal washer between the rotor and lower bearing grommets. It is important that this washer be in place when bearing is reassembled.
3. Remove the top half of bearing clamp to replace the ball bearing assembly.
4. When re-inserting rotor shaft into the bearing holder, make certain the flat washer is placed between the rotor and bearing grommets.

DIVIDING NETWORK

1. Remove: Middle back cover of 142/122/122RV.
   LOWER back cover of 222RV.
   LOWER and UPPER back covers of older model 222 speakers.
   LOWER back cover only of newer model 222 speakers.
2. **142/122/222:** Disconnect RED/BLACK Dividing Network leads from socket on the Rotor amplifier. On older 222 models, you must loosen cork mounted in hole in the upper shelf to extract excess RED/BLACK lead stored in the upper cabinet.
3. **122RV/222RV:** Disconnect RED/BLACK Dividing Network lead from its socket on the Reverb amplifier.
4. Remove the two screws or wingnuts holding Dividing Network to cabinet shelf on every model except 222RV. The 222RV's Dividing Network is fastened to the front of the lower cabinet.
5. Remove the Dividing Network from the cabinet.

Replacement:

Reverse Dividing Network removal procedure previously outlined.

EXPLODED VIEW, MECHANICAL ASSY.: 122,122V,122RV,142 SPEAKERS

REVERB AMPLIFIER

POWER AMPLIFIER

##NOT PART OF 054007/045872 ASSY

117V 60HZ 054007

117V 50HZ 045872

SPRING 061307

USED IN REVERB MODELS ONLY

051062 USED IN REVERB MODELS AND 251 ONLY

SHIELD COVER 017533

MOTOR SHIELD 017525

WITHOUT MOTOR SHIELD 037564 117V 60HZ

045898 117V 50HZ

WITH MOTOR SHIELD 044685 117V 60HZ

045880 117V 50HZ

NOT PART OF 044685/045880 ASSY

011700 60HZ

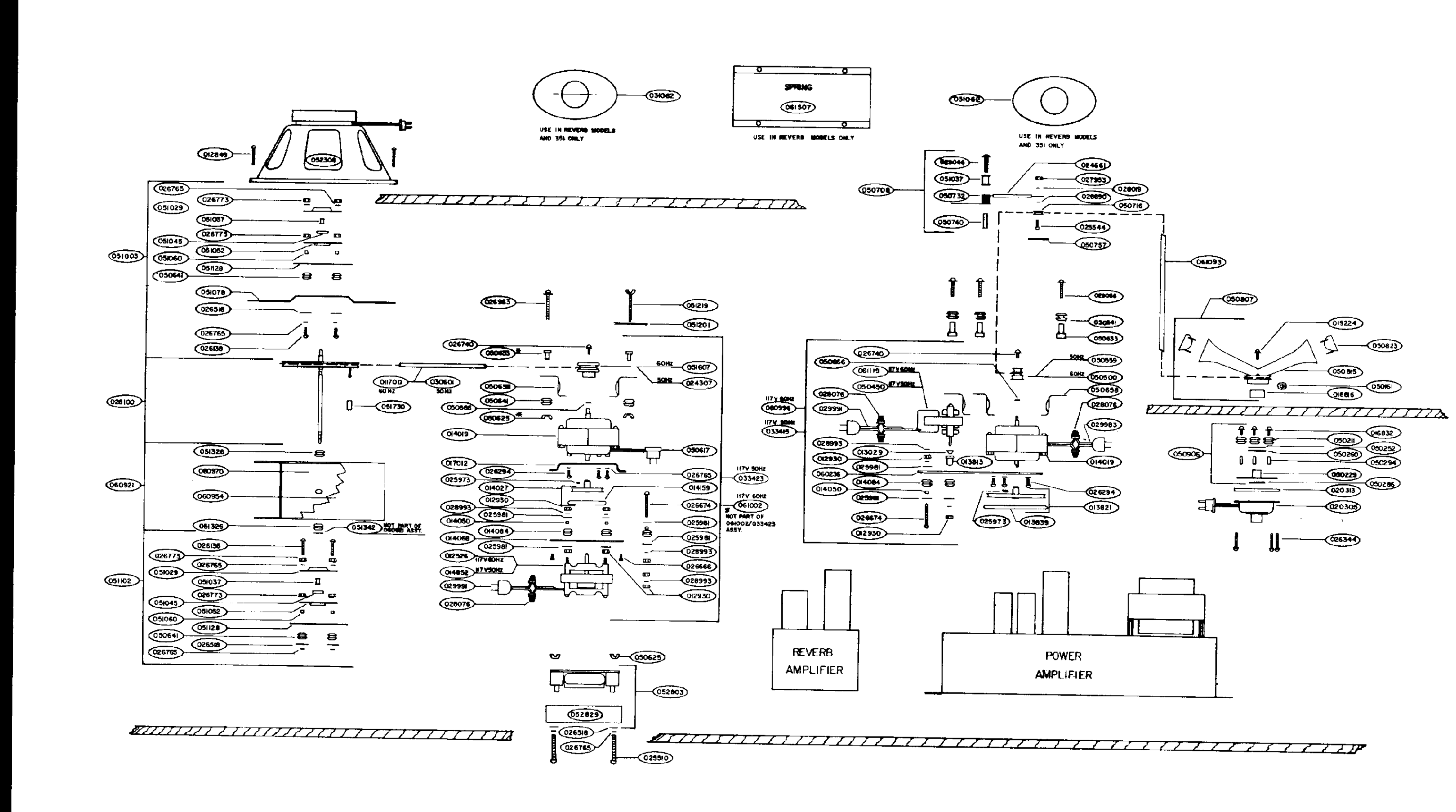
030801 50HZ

NOT PART OF 051300 ASSY

EXPLODED VIEW, MECHANICAL ASSY.: 122,122V,122RV,142 SPEAKERS

PARTS LIST, MECHANICAL ASSY.: 122,122V,122RV,142 SPEAKERS

010728	Bracket, Motor Mounting
010744	Lever, Locking
010751	Bumper, Rubber
011700	Belt, Drive, Lower, 60Hz
012526	Motor, Small, 117V 60Hz
012849	Screw, 10-24 x 1¼″
012930	Nut, Hex, 6-32 x 5/16″ x 7/64″
013029	Slinger, Oil
014019	Motor, Large, 117V 50/60Hz
014027	Pulley Assembly, Rim Drive
014050	Bushing
014068	Bracket, Small Motor Mounting
014084	Grommet
014159	Ring, "O"
014266	Bracket, "U"
014795	Motor, Small, 117V 60Hz
014845	Motor, Small, 117V 50Hz
014852	Motor, Small, 117V 50Hz
014928	Pulley, Motor, 50Hz
016816	Bearing Assembly, Treble Speaker
016832	Screw, 6-32 x 1⅛″
017012	Bracket, "U"
017525	Shield, Slow Motor Mount
017533	Cover, Slow Motor Mount
018309	Pulley, Motor 60Hz
018713	Cover, Rotor, Large—Cloth
019224	Screw, 6-32 x ⅝″
020305	Speaker, Treble Driver, 16 Ohm
020313	Ring, Spacer, Treble Driver
021048	Belt, Treble Drive — Graphited
024661	Tubing, Neoprene 1/16″ x 2¾″
025452	Screw, 8-32 x ⅝″
025460	Screw, 10-24 x ⅜″
025478	Screw, Machine, 8-32 x 1″
025510	Screw, 10-24 x 2¾″
025544	Screw, 10-32 x ½″
025973	Screw, Set, 10-32 x 3/16″
025981	Washer, No. 6 x 9/16″ x 3/64″
026138	Screw, 8-32 x 13/16″
026294	Screw, 8-32 x ¼″
026328	Washer, Lock, Dome
026344	Screw, 10-24 x 1½″
026518	Washer, No. 10 x ¾″ x 3/64″
026625	Washer, Flat, No. 10
026633	Washer, Flat
026641	Washer, No. 8 x 31/32″ x 1/16″
026666	Screw, No. 6 x ¼″
026674	Screw, 6-32 x 2¼″
026690	Washer, No. 10 x ½″ x 1/16″
026708	Screw, 10-24 x 1¾″. Sems Int. Lockwasher
026740	Screw, 8-32 x ⅜″
026765	Washer, Lock, No. 8
026773	Nut, Hex 8-32 x 11/32″ x ⅛″
027953	Nut, Hex 10-32 x ⅜″ x ⅛″
028019	Washer, Lock, No. 10 x ⅜″
028076	Nut, Wire
028993	Washer, Lock, No. 6 x 9/32″
029785	Cable Assembly, 117V, 29″ long—brown
029918	Cable Assembly, 117V, 29″ long—white
029983	Cable Assembly, 117V, 9″ long—brown
029991	Cable Assembly, 117V, 9″ long—white
030601	Belt, Drive, Lower, 50Hz
031062	Speaker, 6 x 9″, 16 Ohm
032292	Rotor, Wood 17″ x 9″
037564	Motor Assembly, 2 Speed, 117V 60Hz
039131	Washer, Lock, Dome
044685	Motor Assembly, 2 Speed, 117V 60Hz Shielded
045872	Motor Assembly, 2 Speed 117V 50Hz
045880	Motor Assembly, 2 Speed 117V 50Hz Shielded
045898	Motor Assembly, 2 Speed 117V 50Hz
047225	Speaker, 6″ x 9″, 16 Ohm
048991	Bushing, Shoulder
050161	Filter, Acoustic — Treble Horn
050211	Grommet
050229	Spindle and Plate Assembly
050252	Washer
050260	Washer, 1-1/16″ x 1½″ x ⅛″
050286	Washer, ¾″ x 1½″ x ⅛″
050294	Bushing
050500	Pulley, 3 Step, 60Hz
050559	Pulley, 3 Step, 50Hz
050625	Nut, Wing, 10-24
050633	Bushing, Shoulder
050641	Grommet
050658	"Z" Bracket, Motor Mounting
050666	"C" Ring
050708	Idler Assembly
050716	Pulley and Bearing Assembly, Idler
050732	Idler Spring
050740	Bushing
050757	Pad, Neoprene 1″ x 4″ x ⅛″
050807	Treble Horn Assembly
050815	Treble Horn
050823	Reflector, Treble Horn Assembly
050906	Spindle Assembly, Treble Horn
051003	Support Assembly, Rotor, Upper
051029	Rotor Bearing Retainer, Upper
051037	Grommet
051045	Ball Bearing, Rotor
051052	Rotor Bearing Retainer, Lower
051060	Bushing
051078	Rotor Support, Upper
051102	Ball Bearing Assembly, Lower Rotor
051128	Plate, Bearing
051300	Rotor Assembly & Cover — 17″
051326	Grommet
051342	Washer, Flat, ⅜″ x ⅞″ x 5/64″
051706	Shaft and Pulley Assembly
051730	Bushing, Rubber
052308	Speaker, 15″, 16 ohm
052803	Crossover Assembly, 16 Ohm, 800Hz
052829	Ring, Spacer, Crossover Network
054007	Motor Assembly, 2 Speed 117V, 60Hz
061507	Reverb Unit
Not Shown:	
020685	Speaker Extension Cable (122RV only)
024968	3-Way Socket w/AC plug and cable (RV models only)
047720	Back Assembly, Upper — 122, 142
038067	Back, Middle — 122
012781	Back, Lower — 122, 122RV, 122V, 142
052233	Back Assembly, Upper — 122RV, 122V
052241	Back Assembly, Middle — 122RV, 122V
037515	Back, Middle — 142

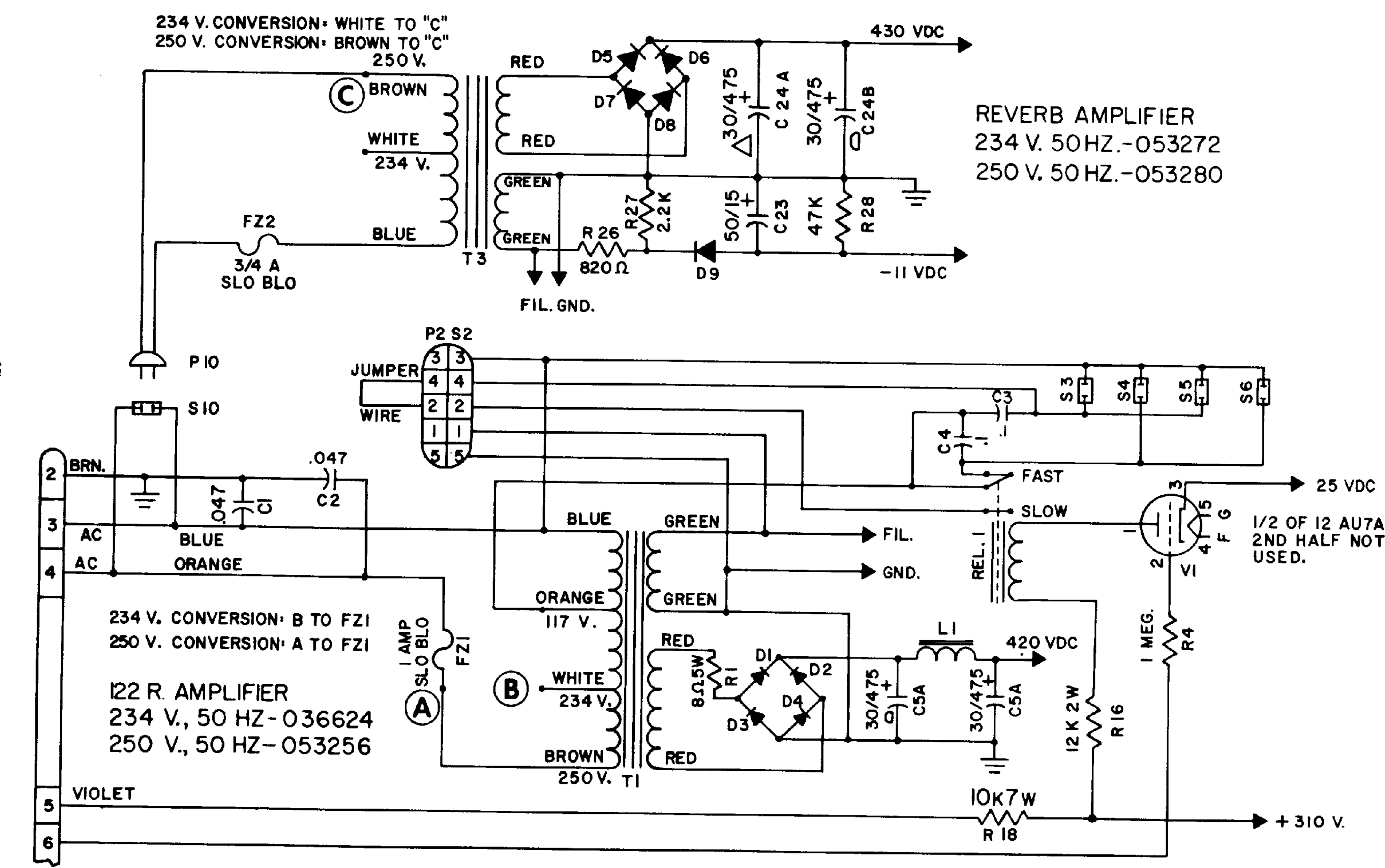


EXPLODED VIEW, MECHANICAL ASSY.: 222, 222RV SPEAKERS

PARTS LIST, MECHANICAL ASSY.: 222, 222RV SPEAKERS

011700	Belt, Drive, Lower, 60Hz
012526	Motor, Small, 117V 60Hz
012849	Screw, Machine, 10-24 x 1¼″
012930	Nut, Hex, 6-32 x 5/16″ x 7/64″
013029	Slinger, Oil
013813	Sleeve, Slow Motor Shaft
013821	Pulley Assembly, Rim Drive
013839	Ring, "O"
014019	Motor, Large, 117V 50/60Hz
014027	Pulley Assembly, Rim Drive
014050	Bushing
014068	Mounting Bracket, Small Motor
014084	Grommet
014159	"O" Ring
014852	Motor, Small, 117V, 50Hz
016816	Bearing Assembly, Treble Speaker
016832	Screw, 6-32 x 1⅛″
017012	U Bracket
019224	Screw, 6-32 x ⅝″
020305	Speaker, Treble Driver, 16 Ohm
020313	Ring, Spacer — Treble Driver
024307	Pulley, Motor, 50Hz
024661	Tubing, Neoprene, 1/16″ x 2¾″
025510	Screw, Machine, 10-24 x 2¾″
025544	Screw, 10-32 x ½″
025973	Screw, Set, 10-32 x 3/16″
025981	Washer, No. 6 x 9/16″ x 3/64″
026138	Screw, Machine, 8-32 x 13/16″
026294	Screw, 8-32 x ¼″
026344	Screw, 10-24 x 1½″
026518	Washer, Flat, No. 10 x ¾″ x 3/64″
026666	Screw, Sheet Metal "B", No. 6 x ¼″
026674	Screw, 6-32 x 2¼″
026690	Washer, No. 10 x ½″ x 1/16″
026740	Screw, 8-32 x ⅜″
026765	Lock Washer, No. 8 x 5/16″
026773	Nut, Hex 8-32 x 11/32″ x ⅛″
026963	Screw, Machine, 10-24 x ⅞″
027953	Nut, Hex, 10-32 x ⅜″ x ⅛″
028019	Washer, No. 10 x ⅜″
028076	Nut, Wire
028100	Shaft & Pulley Assembly
028993	Lock Washer, No. 6 x 9/32″
029066	Screw, 10-24 x 1⅝″, Sems Flatwasher
029983	Cable Assembly, 117V, 9″ Brown
029991	Cable Assembly, 117V, 9″ White
030601	Belt, Drive, Lower, 50 Hz
031062	Speaker, 6 x 9″, 16 Ohm
033415	Motor Assembly, 2 Speed, 117V 50Hz
033423	Motor Assembly, 2 Speed, 117V 50 Hz
047225	Speaker, 6″ x 9″ 16 Ohm
050161	Filter, Acoustic — Treble Horn
050211	Grommet, 9/32″ x 13/32″ x 5/16″
050229	Spindle and Plate Assembly
050252	Washer, Shim
050260	Washer, Nylon, 1-1/16″ x 1½″ x ⅛″
050286	Washer, Nylon, ¾″ x 1½″ x ⅛″
050294	Bushing
050450	Motor, Small, 117V 50Hz
050500	Pulley, 3 Step, 60 Hz
050559	Pulley, 3 Step, 50 Hz
050617	Plug, 2 Pin, AC
050625	Nut, Wing, 10-24
050633	Bushing, Shoulder
050641	Grommet, 1″ x ¾″ x 5/16″
050658	"Z" Bracket, Motor Mounting
050666	"C" Ring
050708	Idler Assembly
050716	Idler Pulley and Bearing Assembly
050732	Spring, Idler
050740	Bushing
050757	Pad, Neoprene, 1″ x 4″ x ⅛″
050807	Horn Assembly, Treble
050815	Horn, Treble
050823	Reflector, Treble Horn Assembly
050906	Spindle Assembly, Treble Horn
051003	Upper Rotor Support Assembly
051029	Upper Rotor Bearing Retainer
051037	Grommet, 9/16″ x ⅜″ x 5/16″
051045	Rotor Ball Bearing
051052	Lower Rotor Bearing Retainer
051060	Bushing
051078	Upper Rotor Support
051102	Ball Bearing Assy., Lower Rotor
051128	Bearing Plate
051201	Belt Adjusting Plate
051219	Screw & Wing Nut Assembly
051326	Grommet
051342	Flat Washer, ⅜″ x ⅞″ x 5/64″
051607	Pulley, Motor, 60 Hz
051730	Rubber Bushing, ⅛″ x ⅜″ x ¾″
052308	Speaker, 15″, 16 Ohm
052803	Crossover Assembly, 16 ohm, 800 Hz
052829	Spacer Ring — Crossover Assembly
060236	Small Motor Mounting Bracket
060921	Rotor & Grommet Assy.
060954	Cover, Small Rotor — Cloth
060970	Rotor, Wood
060996	Motor Assembly, 2-Speed, 117V, 60Hz
061002	Motor Assembly, 2-Speed, 117V 60Hz
061093	Belt, Treble Drive
061119	Motor, Small, 117V 60Hz
061507	Reverb Spring (Reverb Models Only)
Not Shown:	
024968	3-Way Socket w/AC Plug and Cable (RV models only)
061036	Back, Cabinet, Upper — 222
061044	Back, Cabinet, Lower — 222, 222RV
061804	Back, Cabinet, Upper — 222RV

SCHEMATIC: 234/250 VOLT TYPE 122 ROTOR AND REVERB AMPLIFIERS



PARTS LIST: TYPE 122 ROTOR AMPLIFIERS — 234 VOLT, 50 Hz (036624) 250 VOLT, 50 Hz (053256)

Rectifier Circuit Assembly		055269
D1, 2, 3, 4	Rectifier, Silicon, 800 PIV, 1A	055228
R1	Resistor, Wire Wound, 8Ω, 5W, 10%	021493
122R Amplifier Chassis		
C1, 2	Capacitor, Mylar, .047mf, 150VAC, 20%	026468
C3, 4	Capacitor, Tubular, .1mf, 600V, 10%	027318
C5A, B	Capacitor, Elect., 30-30-30-10mf, 475V	029892
FZ1	Fuse, 1A, 250V Slo-Blo	038158
L1	Choke, Filter, Triad	055111
P1	Plug, 6 Pin, Amphenol	060442
P2	Plug Assy., 5 Pin — Jumper	017574
Rel 1	Relay, Single Pole, Double Throw	055129
S2	Socket, 5 Contact, Eby	029652
S3, 4, 5, 6	Socket, AC	055137
T1	Transformer, Power, 250V, 50Hz	011015

PARTS LIST: REVERB AMPLIFIER — 234 VOLT, 50/60 Hz (053272) 250 VOLT, 50/60 Hz (053280)

Rectifier Circuit Assembly, Complete		061465
C23	Capacitor, Elect., 50mf, 15V	028324
D5, 6, 7, 8	Rectifier, Silicon, 800PIV, 1A	055228
D9	Rectifier, Silicon, 100PIV, 1A	021154
R26	Resistor, 820Ω	028373
R27	Resistor, 2.2KΩ	028571
R28	Resistor, 47KΩ	028506
Reverb Amplifier Chassis		
C24A, B, C, D	Capacitor, Elect., 30-30-30-10mf, 475V	029892
FZ2	Fuse, ¾A, 250V, Slo-Blo	029884
P7RV	Plug, 2 Pin — Eby	029165
P10	Cable Assembly, 29″ w/Plug	029785
P12, 13	Plug, Phono	029876
R40	Resistor, 12KΩ, 1W, 10%	028035
R41	Resistor, 470Ω	028068
S7RV, S11	Socket, 2 Contact	029298
T3	Transformer, Power, 117V, 50/60Hz	016923
T4	Transformer, Output	025411

Note: All resistors ½W, 10% unless otherwise noted.

2N3859A Q1,2

REVERB SPRING

#19 LAMPS

REVERB POWER SUPPLY

REVERB AMPLIFIE

WOOD ROTOR SLOW FAST

HORN SLOW FAST

JUMPER WIRE

P1

P2 S2

SE IN RV MODELS ONLY SLO BLO

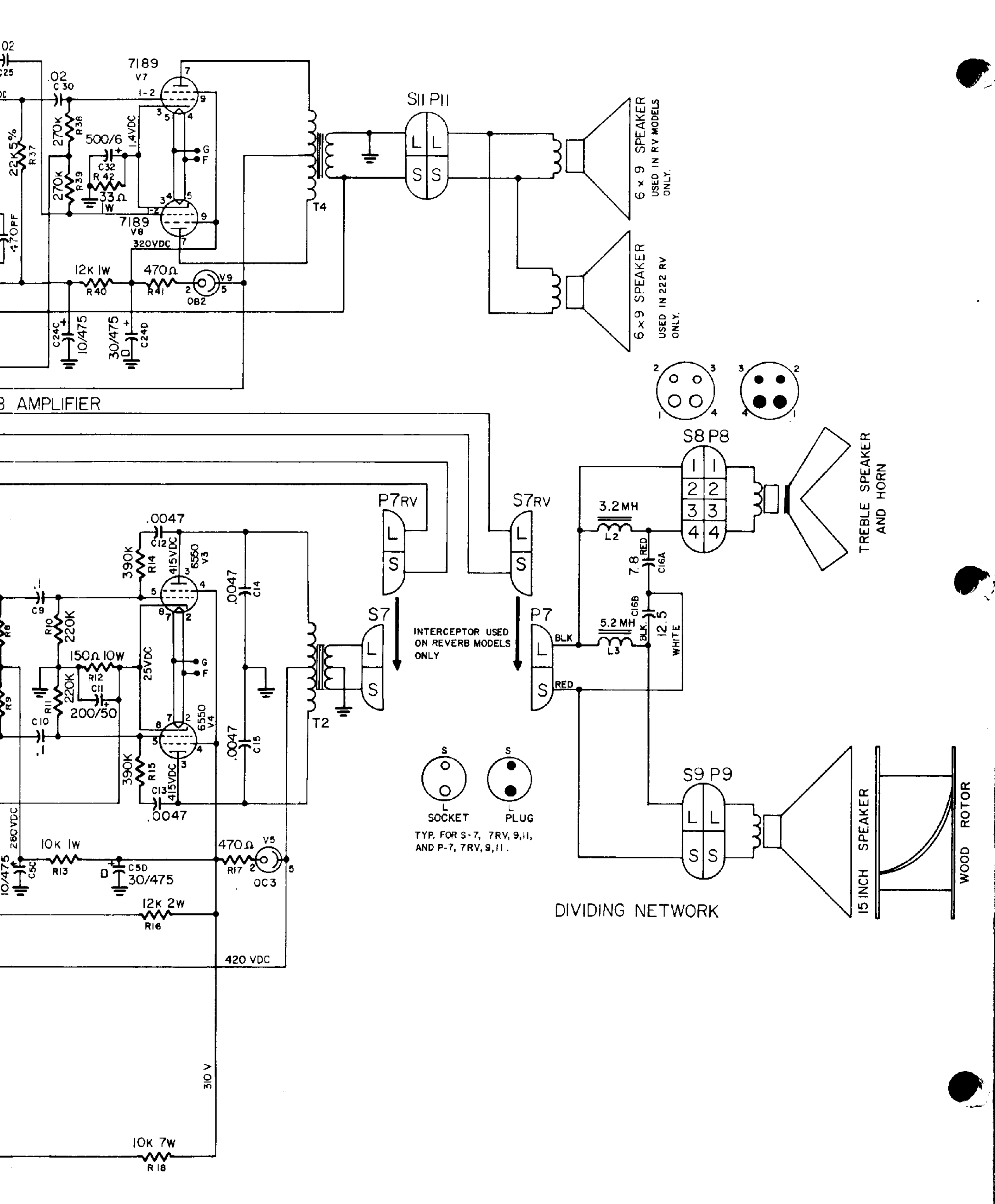
1/2 OF 12 AU7A
2ND HALF NOT USED

AMPLIFIER

POWER SUPPLY

VIOLET

CAPACITOR NO.5
AND 24
30/30/30/10 AT 475V.



7189
V7
.02
C30
.02
C25
270K
R38
22K 5%
R37
500/6
C32
1.4VDC
G
F
R 42
33Ω
1W
270K
R39
470PF
7189
V8
320VDC
T4
S11 P11
L L
S S
6 x 9 SPEAKER
USED IN RV MODELS ONLY.
12K 1W
R40
470Ω
R41
V9
0B2
C24C
10/475
30/475
C24D
6 x 9 SPEAKER
USED IN 222 RV ONLY.
AMPLIFIER
S8 P8
TREBLE SPEAKER AND HORN
P7RV
S7RV
3.2MH
L2
.0047
C12
390K
R14
415VDC
6550
V3
.0047
C14
7.8
RED
C16A
C16B
12.5
WHITE
5.2MH
L3
BLK
.1
C9
R10
220K
S7
P7
INTERCEPTOR USED ON REVERB MODELS ONLY
BLK
RED
150Ω 10W
R12
C11
200/50
25VDC
G
F
R11
220K
C10
.1
T2
6550
V4
.0047
C15
390K
R15
415VDC
C13
.0047
SOCKET
PLUG
TYP. FOR S-7, 7RV, 9,11, AND P-7, 7RV, 9,11.
S9 P9
15 INCH SPEAKER
WOOD ROTOR
260VDC
10/475
C5C
10K 1W
R13
C5D
30/475
470Ω
R17
V5
OC3
12K 2W
R16
DIVIDING NETWORK
420 VDC
310 V
10K 7W
R18

PARTS LIST: TYPE 122 ROTOR AMPLIFIER — 117 VOLT, 60 Hz (036616) 117 VOLT, 50 Hz (053231)

Rectifier Circuit Assembly, Complete 055269

D1, 2, 3, 4	Rectifier, Silicon, 800PIV, 1A	055228
R45	Resistor, Wire Wound, 8Ω, 5W, 10%	021493

122R Amplifier Chassis

C1, 2	Capacitor, Mylar, .047mf, 150VAC, 20%	026468
C3, 4	Capacitor, Tubular, .1mf, 600V, 10%	027318
C5A, B, C, D	Capacitor, Elect., 30-30-30-10mf, 475V	029892
C6	Capacitor, Mylar, .015mf, 600V, 10%	032458
C7	Capacitor, Mica, .001mf, 500V, 10%	032409
C8	Capacitor, Mylar, .015mf, 600V, 10%	032458
C9, 10	Capacitor, Tubular, .1mf, 600V, 10%	027318
C11	Capacitor, Elect. 200mf, 50V	020081
C12, 13	Capacitor, Tubular, .0047mf, 1600V	033399
C14, 15	Capacitor, Tubular, .0047mf, 1600V	033399
FZ1	Fuse, Slo-Blo, 1.5A, 125V	021766
L1	Filter Choke	055111
P1	Plug, 6 pin w/mtg plate—Amphenol	060442
P2	Plug Assembly, 5 Pin—Jumper	017574
R1	Resistor, 10KΩ	028548
R2	Potentiometer, 100K, Audio Taper	055186
R3	Resistor, 10KΩ	028548
R4, 5	Resistor, 1MΩ	024125
R6	Resistor, 1.2KΩ	018036
R7	Resistor, 1MΩ	024125
R8, 9	Resistor, 56KΩ, 1W, 10%	021550
R10, 11	Resistor, 220KΩ	013615
R12	Resistor, Wire Wound, 150Ω, 10W, 10%	020115
R13	Resistor, 10KΩ, 1W, 10%	020214
R14, 15	Resistor, 390KΩ,	018010
R16	Resistor, 12KΩ, 2W, 10%	021568
R17	Resistor, 470Ω	028068
R18	Resistor. Wire Wound, 10KΩ, 7W, 10%	021501
Rel 1	Relay, Single Pole, Double Throw	055129
S2	Socket, 5 Contact w/Mtg plate—Eby	029652
S3, 4, 5	Socket, 2 Contact—AC	055137
S6, 10	Socket, 2 Contact—AC	055137
S7	Socket, 2 Contact—Cinch	029298
T1	Transformer, Power, 117V, 50Hz	016196
T1	Transformer, Power, 117V, 60Hz	011007
T2	Transformer, Output	055103
V1, 2	Tube, 12AU7A	029033
V3, 4	Tube, 6550	022301
V5	Tube, 0C3	022319
Not Shown	Knob, Bar — Black	020289
Not Shown	Fuseholder, Buss HKP	055178
Not Shown	Socket, 8-Contact—Octal (for tubes 6550, 0C3)	020321
Not Shown	Socket, 9-Contact (For tubes 12AU7A)	020339
Not Shown	Socket, Elect. Capacitor	055210

DIVIDER NETWORK (052803)

C16A, B	Capacitor, Paper, 12.5mf/7.8mf, 50V, 5%	052852
P7	Plug, 2 Pin—Eby	029165
S8	Socket, 4 Contact	018929
S9	Socket, 2 Contact	052860
	Not Shown Spacer Ring	052829

NOTE: All resistors ½W, 10% unless otherwise noted.

REVERB AMPLIFIER (061440)

Rectifier Circuit Assembly, Complete		061465
C23	Capacitor, Elect., 50mf, 15VDC	028324
D5, 6, 7, 8	Rectifier, Silicon, 800PIV, 1A	055228
D9	Rectifier, Silicon, 100PIV, 1A	021154
R26	Resistor, 820Ω	028373
R27	Resistor, 2.2KΩ	028571
R28	Resistor, 47KΩ	028506
Preamplifier Circuit Assembly, Complete		060061
C18, 19	Capacitor, Disk, 100pf, 1000V, 20%	028027
C20	Capacitor, Elect., 50mf, 15V	028324
C21, 22	Capacitor, Elect., 5mf, 50V	028589
C33	Capacitor, Elect., 10mf, 12V	028415
M1, 2	Lamp, #19	061515
Q1, 2	Transistor 2N3859A, NPN	061366
R19	Resistor, 15Ω	018051
R20	Resistor, 3.9KΩ	028563
R21	Resistor, 470Ω	028068
R22	Resistor, 5.6KΩ	024844
R23	Resistor, 3.9KΩ	028563
R24	Resistor, 18KΩ	018028
R25	Resistor, 100KΩ	028498
R29	Resistor, 82KΩ	027102
R31	Resistor, 150KΩ, 1W, 10%	024117
R44	Resistor, 100KΩ	028498
Amplifier Circuit Assembly (Less tubes; C24; R40, R41)		022137
C24A, B, C, D	Capacitor, 30-30-30-10mf, 475V	029892
C25	Capacitor, Disk, .02mf, 500V, 10%	028423
C26	Capacitor, Disk, .0047mf, 100V, 10%	028431
C28	Capacitor, Elect., 10mf, 12VDC	028415
C29	Capacitor, Disk, 470pf, 1000V, 20%	028662
C30	Capacitor, Disk, .02mf, 500V, 10%	028423
C32	Capacitor, Elect., 500mf, 6V	028407
P7RV	Plug, 2 Pin—Eby	029165
P12, 13	Plug, Phono	029876
R30	Resistor, 220Ω	028381
R32	Potentiometer, 10KΩ, Audio Taper	021014
R33	Resistor, 100Ω	028399
R34	Resistor, 2.2KΩ	028571
R35	Resistor, 150KΩ	028357
R36	Resistor, 2.2KΩ	028571
R37	Resistor, 22KΩ, ½W, 5%	028365
R38, 39	Resistor, 270KΩ	028340
R40	Resistor, 12KΩ, 1W, 10%	028035
R41	Resistor, 470Ω	028068
R42	Resistor, 33Ω, 1W, 10%	028332
R43	Resistor, 22KΩ, ½W, 5%	028365
S7, S7RV, S11	Socket, 2 Contact	029298
T3	Transformer, Power, 117V, 50/60Hz	061523
T4	Transformer, Output	025411
V6	Tube, 12AU7A	029033
V7, 8	Tube, 7189	029025
V9	Tube, OB2	029017
FZ2	Fuse, ¾A, 250V, Slo-Blo	029884
Not Shown	Contact, Socket, Miniature (for M1, M2)	028670
Not Shown	Tube Socket, 9 Contact	028449
Not Shown	Tube Socket, 7 Contact	029306

NOTE: All resistors ½W, 10% unless otherwise noted.



PRINTED IN U.S.A.